

CLAIMS

1. A sheet deceleration apparatus for reducing the speed of a sheet of material moving along a travel path at a first speed, said apparatus comprising:

a first rotatable roller being rotatable about a first axis, said first axis being substantially perpendicular to the travel path and said first roller being positioned on one side of the travel path;

a second rotatable roller being rotatable about a second axis, said second axis being substantially perpendicular to the travel path and said second roller being positioned on the other side of the travel path and spaced from said first roller so that the sheet of material can pass between said first and second rollers; and

at least one of said first and second rollers being moveable relative to and toward the other of said first and second rollers to nip the sheet between said first and second rollers during at least a portion of the travel of the sheet past said first and second rollers.

2. The apparatus of claim 1 wherein one of said first and second rollers is driven.

3. The apparatus of claim 2 wherein the other of said first and second rollers is not driven.

4. The apparatus of claim 3 wherein said other roller is moveable toward said one roller.

5. The apparatus of claim 4 wherein said other roller is moveable between a retracted position in which said other roller is sufficiently spaced from said one roller so as to not nip the sheet of material and an extended position in which the other roller is moved toward said one roller a distance sufficient to nip the sheet of material.

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6. The apparatus of claim 1 wherein one of said first and second rollers is reciprocally moveable toward and away from the other of said first and second rollers.

7. The apparatus of claim 6 including a servo motor and a drive linkage assembly between
10 said servo motor and said one roller to reciprocally move said one roller..

8. The apparatus of claim 1 wherein said first roller comprises a plurality of first laterally spaced rollers and said second roller comprises a plurality of second laterally spaced rollers.

15 9. A combination sheet stacking and deceleration apparatus comprising:
an entry conveyor for delivering sheets of material along a travel path toward a discharge end of said conveyor;

a stacking hopper positioned downstream from the discharge end of said entry conveyor; and

20 a sheet deceleration apparatus positioned between the discharge end of said entry conveyor and said stacking hopper, said sheet deceleration apparatus including a first roller positioned below the travel path and a second roller positioned above the travel path, at least one of said first and second rollers being moveable toward and away from

the other of said first and second rollers to nip a sheet passing between said first and second rollers.

10. The apparatus of claim 9 wherein said entry conveyor is a belt conveyor.

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11. The apparatus of claim 9 wherein one of said first and second rollers is driven and the other of said first and second rollers is not driven.

12. The apparatus of claim 11 wherein said entry delivers said sheets at a line speed and
10 wherein said one driven roller is driven at a speed less than said line speed.

13. The apparatus of claim 9 wherein said first roller comprises a plurality of first laterally spaced rollers and said second roller comprises a plurality of second laterally spaced rollers.

15 14. The apparatus of claim 9 including a servo motor and a drive linkage between said servo motor and said at least one roller for moving said at least one roller.

15. A method for decelerating a sheet of material traveling along a travel path at a line speed, said method comprising:

20 delivering said sheet of material between first and second rollers, said first and second rollers being rotatable on first and second axes, respectively, said first and second axes being substantially perpendicular to said travel path; and

moving at least one of said first and second rollers toward the other of said first and second rollers to nip said sheet of material during at least a portion of the sheet travel between said first and second rollers.

5 16. The method of claim 15 including driving one of said first and second rollers at a speed less than said line speed.

17. The method of claim 15 including delivering a series of sheets of material along said travel path at a line speed wherein each of said sheets includes a leading edge and a trailing edge
10 and wherein said series of sheets are spaced from adjacent sheets in the travel path to define a gap between the trailing edge of one sheet and the leading edge of an adjacent following sheet.

18. The method of claim 17 including moving said at least one roller away from said other roller after nipping said sheet of material to permit delivery of the adjacent following sheet
15 between said first and second rollers and further including synchronizing the delivery of said series of sheets and the moving of said at least one roller so said at least one roller moves toward said other roller and away from said other roller during the travel of each sheet between said first and second rollers.

20 19. The method of claim 18 including forming said sheets of material on a rotary press prior to said delivering step.

20. The method of claim 19 including moving said at least one roller toward and away from said other roller utilizing a servo motor and wherein said synchronizing step includes controlling the actuation of said servo motor in response to the rotation of said rotary press.